

1. Title of the course

Smart Transportation Systems and Analytics

2. Content of the course

No.	Topic	Detailed description	Number of hours
1	Data-Driven Traffic Prediction and Pattern Analysis	<p>This lecture explores how big data and machine learning methods can be employed to predict traffic patterns. Emphasis will be placed on data collection methods, algorithms for predictive modelling, and practical applications in identifying congestion hotspots and peak travel times.</p> <p>Key Topics:</p> <ul style="list-style-type: none"> • Introduction to big data in transportation • Machine learning algorithms for traffic prediction • Case studies on traffic pattern analysis 	3
2	Traffic Signal Optimization for Smart Cities	<p>Students will learn various optimization techniques for traffic signals, focusing on adaptive control systems and algorithms. The session includes methods like dynamic signal timing and strategies for emergency vehicle priority.</p> <p>Key Topics:</p> <ul style="list-style-type: none"> • Basics of traffic signal systems • Techniques for dynamic signal timing • Emergency vehicle prioritization strategies 	5
3	Public Transit Integration and Priority Systems	<p>This module delves into how public transit can be effectively integrated with city traffic management. Discussions will cover transit signal priority systems, dedicated bus lanes within signalized junctions, and dynamic route planning to enhance public transportation efficiency.</p> <p>Key Topics:</p>	3

		<ul style="list-style-type: none"> • Overview of public transit control • Techniques for transit signal prioritization • Dynamic and flexible routing strategies 	
4	Intelligent Transportation System: Components and Applications	<p>This session provides an overview of the components of intelligent transportation systems (ITS) and their applications in urban settings. Students will gain insight into how ITS technologies improve overall traffic management.</p> <p>Key Topics:</p> <ul style="list-style-type: none"> • Components of intelligent transportation systems • Applications in traffic monitoring and control • Future trends in ITS technologies 	3